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(54) PLASTICS HEADED NAIL.

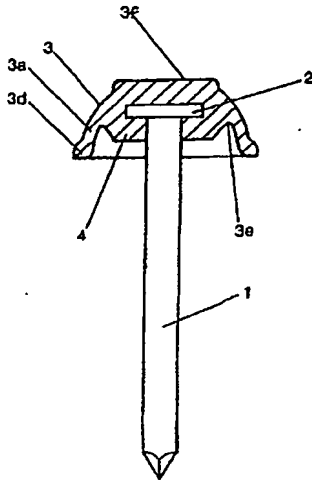
(51) F16B15/02.

(71) Specialized Washers & Gaskets Ltd.

(72) Hardman, Gerald William.

(74) WWM

(57) A nail 1 with a plastics material cap 3 moulded to the head 2 of the nail 1 seals against the surface into which the nail is driven by the deformation of skirt 3a of the cap 3 to the shape of that surface. The under-surface of the cap has a load spreading part 4 with an enlarged diameter relative to the diameter of the nail's head 2. In order to enhance the skirt deformation a groove 3e is formed between the load spreading part of the inner surface of the skirt.



28 MAY 1990

Plastic cap can be coloured during manufacture to match the colour of prepainted material for which fastener is intended

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Complete Specification

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**Documents**

Abstract/Abridgement  
Document is not stored as text

**Conventions**

Date (320) Country (330) Application Number

**Current Applicants/Licensees**

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No address for service on record or public access is restricted

**Inventors (72)**

Hardman, Gerald William

**Applicant/Licensee History**

No applicant/licensee on record or public access is restricted

**Actions**

Action	Completed	Due	Journal	Published
Renew	17-APR-2001	30-MAY-2001	1463	25-MAY-2001
Renewal Notice	28-FEB-2001	28-FEB-2001		
Renew	29-MAY-1998	30-MAY-1998		
Renew	24-APR-1995	30-MAY-1995		
Renew	04-MAR-1992	30-MAY-1992		
Registered	21-SEP-1990	21-SEP-1990		
Application Accepted	09-APR-1990	09-APR-1990	1332	28-MAY-1990
Filed	28-FEB-1987	28-FEB-1987		

**Related Patents**

From

To

No associations on record or public access is restricted

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**Objections**      **Objection Type**      **Lodged Date**  
No objections on record or public access is restricted

**Financial Interest**  
No financial interest on record or public access is restricted

**Renewal Interest**  
SPECIALISED WASHERS & GASKETS LIMITED  
Tasman Road, Otaki, New Zealand

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PATENTS ACT 1953

Dated February 28, 1987

COMPLETE SPECIFICATION

AN IMPROVED FASTENER

X/WE SPECIALISED WASHERS AND GASKETS LIMITED, a New Zealand  
company of Tasman Road, Otaki, New Zealand

do hereby declare the invention for which x/we pray that a Patent may be granted  
to me/us, and the method by which it is to be performed, to be particularly  
described in and by the following statement:

Our invention comprises an improved form of nail.

Traditional fasteners for corrugated iron, for example, and like cladding materials comprise a nail having a lead cap. The head of the nail is embedded in the lead cap. In use the nail is driven through the iron and into the framing member below, to retain the iron in position. Traditional lead headed nails suffer from the disadvantage that where the roofing iron is subjected to variations in temperature the lead head of the nail and/or the nail itself can be lifted by any resulting expansion of the iron. On contraction the nail cap can remain in such a lifted position so that the iron is loosened and the nail cap-to-iron seal is broken, allowing the elements access beneath the cap and into the aperture through which the shank of the nail extends, causing rusting of the iron cladding and the nail.

Fasteners comprising a nail having a cap formed of polyethylene or a similar plastics material are also available. The advantage of forming the nail cap of a plastics material is that the material is to a degree flexible and moreover has a memory, unlike lead. Where temperature variations result in expansion and contraction of the iron beneath the nail the plastics cap tends to flex to accommodate the expansion and to then return to its original position on contraction. The cap to cladding seal

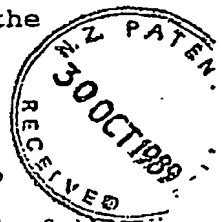


is thus longer lasting. Another advantage of plastic headed fasteners is that the plastic cap can be coloured during manufacture to match the colour of prepainted or coated iron or other material for which the fastener is intended, so that painting afterwards is not required.

Plastic headed fasteners and nails in particular suffer from the disadvantage however that the cap can tend to work loose when the nail is driven or hammered into the iron, and can as a result then more readily be forced off the nail by wind loading on the cladding subsequently, allowing the nail head to pull through the cladding sheet. In addition, some available forms of plastic fastener comprise a number of components which must be assembled together before and/or after use of the fastener. Thus, while it is accepted that plastic headed fasteners offer advantages, there is a need for a form of plastic headed fastener which is both sufficiently robust to overcome or at least minimise the problems referred to, and which is also simple and convenient to use.

Our invention provides an improved or at least an alternative form of nail for iron roof cladding and the like.

In broad terms the invention may be said to comprise a nail comprising a shank, a head at one end of the shank, a cap formed of a plastics material moulded to the



head such that the head is embedded in the cap and having a top part as a strike surface for the nail and a peripheral skirt depending downwardly from the cap the thickness and flexibility of which is such that in use of the nail as the nail is driven into a surface the skirt will deform as necessary to seal the cap against the surface, and an integrally formed load spreading part of said cap beneath said head and of an enlarged diameter relative to the head and defined by a circumferential groove formed between said load spreading part and the inside surface of said skirt.

The shank of the nail may optionally be provided with gripping twists or the like.

The accompanying drawing illustrates a preferred form of the nail of the invention, by way of example.

The drawing is a side view of the preferred form of nail of the invention with the plastic cap thereof shown in cross-section.

The nail of the invention comprises a shank 1 having a head 2. The head may be a conventionally shaped nail head or may be some other shape of head suitable for embedding in the cap of the nail.

A cap 3 formed of a relatively rigid but to an extent resilient plastics material is moulded onto the head



of the nail such that the head 2 is embedded therein as shown. Preferably the cap 3 is formed of high density polyethylene or the like.

The top of the head of the nail is preferably covered by the plastic material of the moulded cap 3 as shown, for decorative purposes and to prevent rusting, but the top of the head 2 may be uncovered, to assist in preventing hammer slip during driving of the nail, as desired.

In accordance with the invention the nail comprises a load spreading part embedded in the cap. In the preferred form of nail shown in the drawing the load spreading part is integrally formed as a part 4 of the cap below the head. This load spreading part 4 may be formed of the same plastics material from which the balance of the cap is formed or may be formed from a separate, harder plastics material in a two step moulding operation.

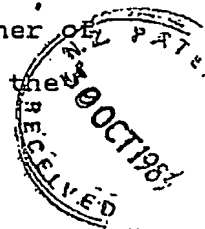
The cap includes a peripheral skirt 3a and the flexibility of the plastics material from which the cap is formed and the thickness of the skirt wall are such that during driving in of the nail the skirt will deform as necessary to seal against the corrugated iron cladding, for example, about the nail so that a flexible weather proof seal is formed. The undersurface of the cap 3 may include flutes which will assist in forming a weather proof seal between the undersurface of the cap and cladding.





In the preferred form of nail the skirt 3a curves downwardly from the cap so that it may be described as being generally concave when viewed from the interior. The wall thickness of the skirt is such that the skirt may deform when the nail is hammered in, to seal about the nail. The skirt 3a includes an enlarged rim part 3d as shown. In addition a circumferential gap or groove 3e is formed between the integral load spreading part 4 of the nail and the skirt, so that the skirt walls may flex as necessary without obstruction. This preferred form nail shown includes an enlarged part 3f on top of the cap intended as a striking surface for a hammer when driving in of the fastener. Although not shown in the drawings, the shank of the preferred form nail is twisted about its longitudinal axis to provide a twisted gripping shank for increased "grip" of the nail in the timber into which it is driven. The head of the preferred form nail is formed from high density polyethylene moulded in place through injection moulding with the load spreading part of the nail being integrally formed.

The load spreading part 4 assists in spreading loads applied, through the plastics cap, during both driving of the nail and during wind loading. The likelihood of the cap being loosened during driving and subsequently dislodged as previously mentioned during wind loading or the like is minimised. In the case of the preferred form of fastener of Fig. 1 in particular, the formation of the skirt 3a of the



fastener cap as shown provides an optimum balance of strength of the skirt and flexibility and resilience, to ensure that the skirt will deform to provide a good cap to cladding seal in use. The raised top part of the fastener further ensures that the fastener is sufficiently robust to take the usual number of hammer blows necessary to drive the fastener without damaging or reducing the performance of the fastener.

The table below shows the relative holding powers of the preferred form fastener as illustrated in Fig. 1 of the invention and of a conventional lead headed and one form of conventional plastic headed fastener. Tests were carried out by applying force to the caps of the three nail types to the point at which the cap of the nail separated from the shank.

TABLE

	Conventional Lead Head Nail	Conventional Plastic Head Nail	Fig. 1. Preferred Form Nail
Cap Separating Force	315 lb	510lb	630 lb

As can be seen, the fastener formed in accordance with the invention gave the best performance.



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The foregoing describes our invention including preferred forms thereof, by of example. Alterations and modifications as will be obvious to those skilled in the art are intended to be incorporated in the scope hereof as defined in the following claims.



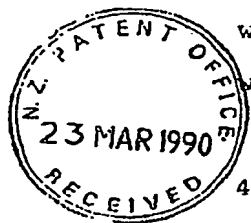
WHAT WE CLAIM IS:

1. A nail comprising a shank, a head at one end of the shank, a cap formed of a plastics material moulded to the head such that the head is embedded in the cap and having a top part as a strike surface for the nail, a peripheral skirt depending downwardly from the cap, and an integrally formed load spreading part of the cap beneath the head and of an enlarged diameter relative to the head and defined by a circumferential groove formed between said load spreading part and the inside surface of said skirt, said skirt extending from the cap towards the end of the shank of the fastener opposite the cap beyond said load spreading part, the thickness and flexibility of the peripheral skirt being such that in use of the nail as the nail is driven into a surface the skirt will deform as necessary to seal against the surface.

2. A nail as claimed in claim 1, wherein the skirt is generally concave in shape when viewed from the interior and is of a substantially constant wall thickness.

3. A nail as claimed in claim 2, wherein the skirt comprises a rim part about the bottom edge of the skirt which is of a slightly enlarged thickness relative to the wall thickness of the skirt.

4. A nail as claimed in any one of the preceding claims, comprising a longitudinally twisted gripping shank.



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5. A nail as claimed in any one of the preceding claims, wherein the cap of the nail is coloured with a predetermined colour.

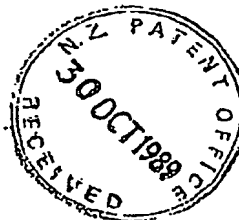
6. A nail as illustrated in the accompanying drawing and as described with reference thereto.

WEST-WALKER, McCABE

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ATTORNEYS FOR THE APPLICANT.



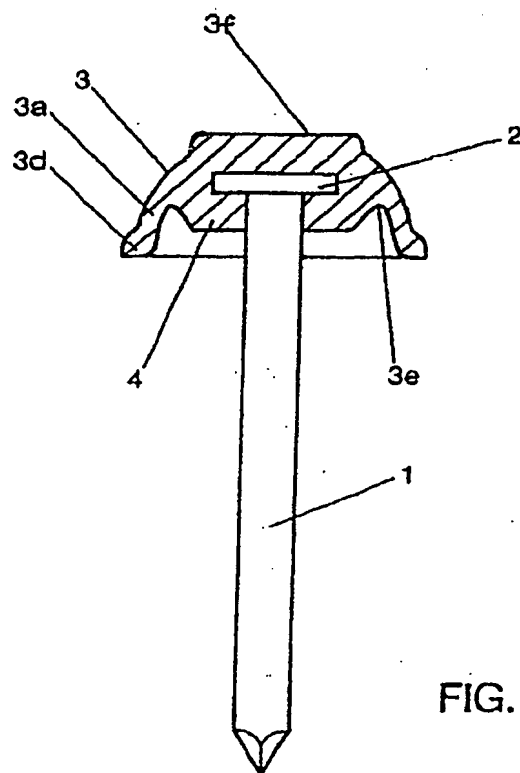


FIG. 1

SPECIALISED WASHERS AND GASKETS LIMITED  
by Attorneys  
WEST-WALKER, McCABE

*H. Walker*